

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ENVIRONMENTAL ASSESSMENT

For

**Hunt Plan Amendment to Allow Hunting of Feral Hogs as a Control
Method on Mingo National Wildlife Refuge, Wayne and Stoddard
Counties, Missouri**

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Abstract: The United States Fish and Wildlife Service proposes to utilize feral hog hunting as part of a multifaceted feral hog control effort on the Mingo National Wildlife Refuge (Refuge) in Wayne and Stoddard Counties, Missouri. Feral hog hunting is compatible with the purpose of the Refuge. This Environmental Assessment (EA) evaluates two possible alternatives for feral hog hunting on the Refuge. The preferred alternative would offer compatible feral hog hunting opportunities while providing non-hunting visitors with other priority public use opportunities (i.e., wildlife observation, wildlife photography, environmental education and interpretation). The general goals of the feral hog hunting program are:

1. Provide additional mechanisms for the reduction or elimination of feral hogs using hunting as part of a comprehensive control effort and amend the Mingo Hunt Plan to include feral hog hunting.
2. Provide the public with safe and enjoyable opportunities to harvest feral hogs in manners that are compatible with the Refuge purpose.
3. Provide the public with opportunities to hunt feral hogs. Feral hog control will not adversely affect localized wildlife populations and will be consistent with the 1997 National Wildlife Refuge System Improvement Act and state of Missouri regulations.

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Section 1.0 Purpose of and Need for Action

1.1 Introduction

The United States Fish and Wildlife Service (Service) has prepared this Environmental Assessment (EA) to evaluate the effects of feral hog hunting on the natural, socioeconomic, and historic/cultural resources of Mingo National Wildlife Refuge (Mingo NWR; Refuge). This EA complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (40 CFR 1500-1509) and Department of the Interior (516 DM 8) and Service (550 FW 3) policies (see Section 1.7 for a list of additional regulations with which this EA complies).

1.2 Location:

The Proposed Action would occur in Stoddard and Wayne Counties, Missouri, within the Mingo Basin on Mingo NWR (Figure 1).

1.3 Background

Mingo National Wildlife Refuge is managed by the U.S. Fish and Wildlife Service under the Department of the Interior and is a unit of the National Wildlife Refuge System (NWRS).

National Wildlife Refuge System Mission and Goals:

The mission of the National Wildlife Refuge System is (National Wildlife System Administration Act of 1966, as amended [16 U.S.C. 668dd668ee]):

“To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

The National Wildlife Refuge System Improvement Act of 1997 established several important mandates aimed at making the management of national wildlife refuges more cohesive. The preparation of comprehensive conservation plans is one of those mandates. The legislation directs the Secretary of the Interior to ensure that the mission of the National Wildlife Refuge System and purposes of the individual refuges are carried out. It also requires the Secretary to maintain the biological integrity, diversity, and environmental health of the National Wildlife Refuge System.

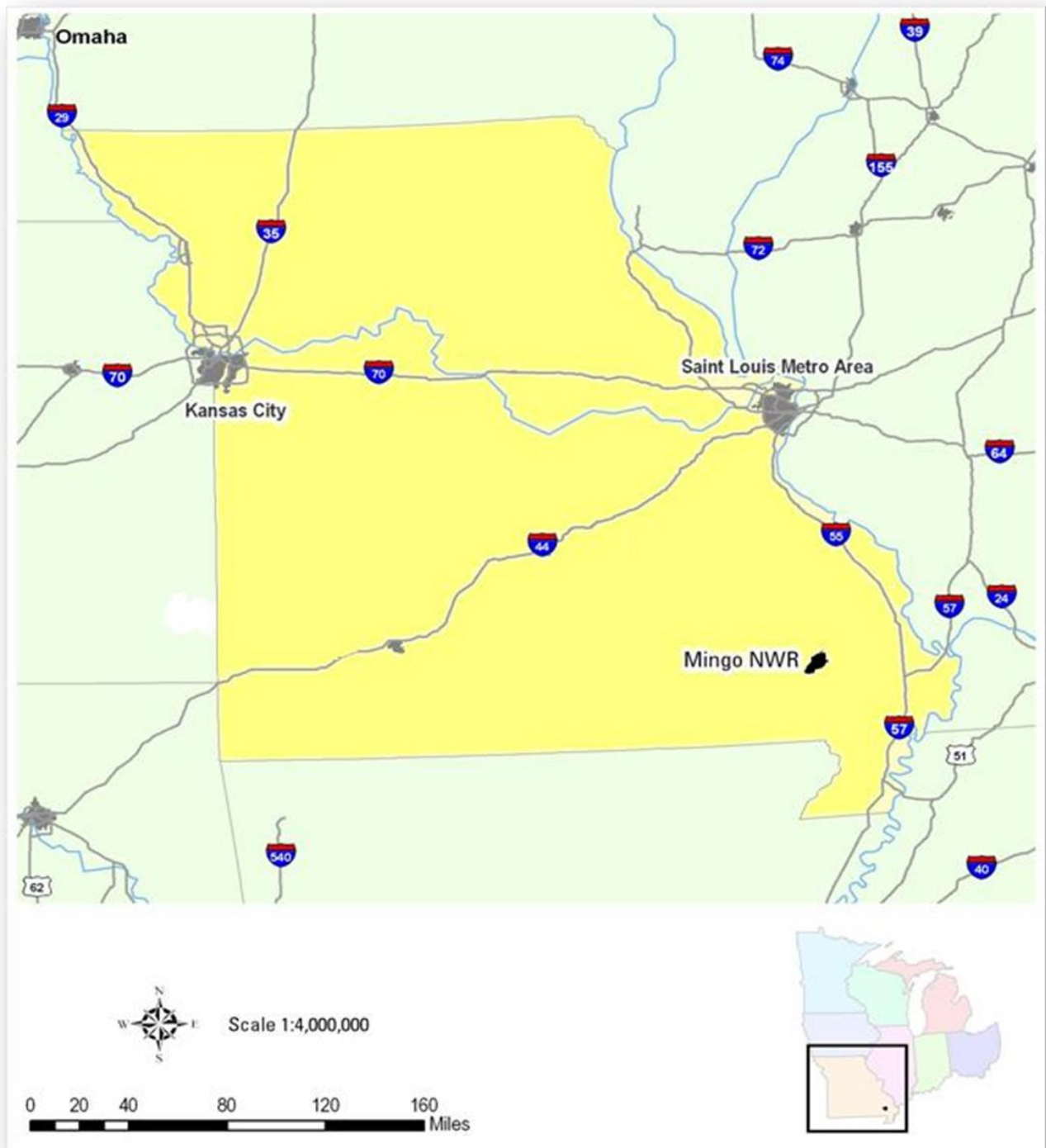


Figure 1. Location of Mingo National Wildlife Refuge, Puxico, MO.

The Refuge System's Mission is to:

- Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered.
- Develop and maintain a network of habitats for migratory birds, anadromous and interjurisdictional fish, and marine mammal populations that is strategically distributed and carefully managed to meet important life history needs of these species across their ranges.
- Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered.
- Provide and enhance opportunities to participate in compatible wildlife-dependent recreation (hunting, fishing, wildlife observation and photography, and environmental education and interpretation).
- Foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.

Mingo National Wildlife Refuge Purposes and Objectives:

Beginning in 1944, land was acquired for Mingo NWR with the approval of the Migratory Bird Conservation Commission. The purpose of the Refuge derives from the Migratory Bird Conservation Act, "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. 715d). In acquiring the first tract for the Refuge, the land was identified as "urgently needed for the protection and conservation of migratory waterfowl and other wildlife." In a 1954 presentation to the Migratory Bird Conservation Commission, the Refuge was described as an "important unit in the Mississippi Flyway" and "an important wintering ground for many species of waterfowl."

One tract of the Refuge was acquired with Bureau of Outdoor Recreation funds. The purpose associated with this funding derives from the Refuge Recreation Act and includes lands "...suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." 16 U.S.C. 460k-1 (Refuge Recreation Act (16 U.S.C. 460k-460k-4), as amended).

An additional purpose was established when Congress designated the 7,730 acre Mingo Wilderness in 1976. The establishing legislation for the Mingo Wilderness (Public Law 94-557) states that "wilderness areas designated by this Act shall be administered in accordance with the applicable provisions of the Wilderness Act...." The purposes of the Wilderness Act are additional purposes of that part of the Refuge that is within the Mingo Wilderness. The purposes of the Wilderness Act are to secure an enduring resource of wilderness, to protect and preserve the wilderness character of areas within the National Wilderness Preservation System (NWPS), and to administer the NWPS for the use and enjoyment of the American people in a way that will

leave these areas unimpaired for future use and enjoyment as wilderness.

Operational Goals:

The Refuge developed a Comprehensive Conservation Plan (CCP) which provides a 15-year management plan that is consistent with Service policy and legal mandates. The CCP was completed in 2007 and established new operational goals and objectives for wildlife, habitat, and public use. The current project is in compliance with the Mingo CCP. The Refuge developed a Hunt Plan in 2013 to outline hunting activities on Mingo NWR.

1.4 Purpose

The purpose of this Environmental Assessment is to evaluate different alternatives for implementing feral hog hunting and to amend the Hunt Plan for Mingo National Wildlife Refuge (Refuge) to include said action.

1.5 Need for the Action

The 1997 National Wildlife Refuge System Improvement Act mandated six priority public uses be provided when feasible and compatible with the purpose of the Refuge. These priority uses include hunting, fishing, wildlife photography, wildlife observation, environmental education and interpretation. The need for action therefore revolves around hunting as a priority use. There is also a need to reserve a portion of the Refuge for non-hunting visitors and special hunts for youth and persons with disabilities (termed accessible hunts), as well as designating no more than a maximum of 40 percent of Refuge lands for migratory bird hunting (per requirements of the Migratory Bird Conservation Act). The combination of hunting and non-hunting areas balances the needs of hunters, who may want as much hunting land as possible, with the needs of the non-hunting public. Other entities or interests affecting the management of hunting opportunities include: Mingo Wilderness Area, adjacent land owners and adjacent state areas.

This Environmental Assessment covers the amendment to the 2013 Mingo NWR Hunt Plan, which is preceded by the overall Visitor Services Plan for the Mingo NWR.

Mingo NWR protects a remnant of the bottomland hardwood and cypress-tupelo swamp ecosystem that once formed a 2.5 million-acre contiguous natural landscape throughout the Mississippi River basin. The 21,592-acre Refuge represents the largest area in southeast Missouri of remaining habitat for numerous native and threatened plant and animal species. The Refuge touches the southeast boundary of the Ozark Plateau and slopes abruptly from an upland oak-hickory forest to bottomland hardwood forest, lower marsh, and expansive swamp and ditch system. Since the beginning of the 20th century, these lands have been drained and deforested for agricultural purposes, which has highly modified the natural landscapes and ecosystem functions. Guided by legal mandates, the Refuge has successfully pioneered techniques that maintain a delicate balance of preservation and active management strategies for reforestation and hydrological integrity of the natural systems for the benefit of migratory birds, other wildlife, and wildlife-dependent public use. The Refuge is located in a community that appreciates both the natural diversity and the rich biological integrity of the Refuge and the surrounding public and private lands that add to the core network of the natural landscape.

Current hunting opportunities within the Refuge include hunting of white-tailed deer, turkey, squirrel, raccoon, bobcat and waterfowl. Rules and regulations for hunting these species were established by the State of Missouri and the U.S. Fish and Wildlife Service.

Feral hogs have recently become established on Mingo NWR and are increasing in population. The invasive hogs compete for resources with native wildlife, destroy habitat and directly impact native species through predation. A comprehensive effort is being undertaken on Mingo NWR to control feral hogs that includes trapping, snaring, the use of catch dogs, opportunistic removal by staff and hunting under Special Use Permits (SUP) by hunters attempting to take native game species during the appropriate season.

Established in 1944 under authority of the Migratory Bird Treaty Act, the 21,592-acre Mingo NWR is located in Stoddard and Wayne counties in southeast Missouri. A shallow basin, the Refuge lies in an abandoned channel of the Mississippi River bordered on the west by the Ozark Plateau and on the east by Crowley's Ridge. The Refuge contains approximately 16,000 acres of bottomland and upland hardwood forest, 3,000 acres of marsh and water, 1,800 acres of cropland and moist soil units, and 170 acres of grassy openings. It is located approximately 150 miles south of St. Louis and 170 miles north of Memphis, TN (Figure 1).

The National Wildlife Refuge System Improvement Act specifically required that people be provided the opportunity to enjoy, understand and be part of wildlife conservation on refuges. The National Wildlife Refuge System Improvement Act states that compatible, wildlife-dependent recreational uses involving hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation are priority public uses of the Refuge System. The Service determines whether these uses are compatible for each individual refuge. A use is determined to be compatible if it does not interfere with the fulfillment of the mission of the Refuge System or the purpose of the individual refuge.

The Service's Regional Director will select one of the alternatives analyzed in detail and will determine, based on the facts and recommendations contained herein, whether this Environmental Assessment (EA) is adequate to support a Finding of No Significant Impact (FONSI) or whether an Environmental Impact Statement (EIS) will be required.

The Service developed a strategic plan for implementing the National Wildlife Refuge System Improvement Act called "Conserving the Future" (U.S. Fish and Wildlife Service, 2011). This plan clarifies the vision for the National Wildlife Refuge System and outlines strategies for improving delivery of the System's mission. The proposed hunting plan amendment is consistent with the priorities and strategies outlined in "Conserving the Future."

1.6 Decision to be made

This EA includes an evaluation of the environmental effects of the action alternatives and provide information to help the Service fully consider environmental impacts. Using the analysis in this EA, the Service will decide whether there would be any significant effects associated with

the alternatives that would require the preparation of an environmental impact statement or whether the Proposed Action should be adopted.

1.7 Regulatory Compliance

This EA was prepared by the Service and represents compliance with applicable Federal statutes, regulations, Executive Orders, and other compliance documents, including the following:

- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996).
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470).
- Clean Air Act of 1972, as amended (42 U.S.C. 7401 *et seq.*).
- Clean Water Act of 1972, as amended (33 U.S.C. 1251 *et seq.*).
- Endangered Species Act of 1973, (ESA) as amended (16 U.S.C. 1531 *et seq.*).
- Executive Order 12898, Federal Action Alternatives to Address Environmental Justice in Minority Populations and Low Income Populations, 1994.
- Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661 *et seq.*).
- National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*).
- Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500 *et seq.*).
- National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 *et seq.*).
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 *et seq.*).
- Protection and Enhancement of the Cultural Environment (Executive Order 11593).
- Regulations for Control of Feral Animals (50 CFR 30.11).

Further, this EA reflects compliance with applicable State of Missouri and local regulations, statutes, policies, and standards for conserving the environment and environmental resources such as water and air quality, endangered plants and animals, and cultural resources.

1.8 Scoping and Public Participation

Numerous comments about hunting were received during the public review period of the CCP and for the Mingo Hunt Plan. A partner's scoping meeting was held with Missouri Department of Conservation (MDC) on November 9th, 2011. A public scoping meeting was held in Puxico, MO on December 15th, 2011 for the 2013 Mingo Hunt Plan and EA. The Refuge staff made a presentation on the planning process and NEPA at the meetings. The public meeting was attended by 87 people. The partner and public scoping meetings provided comments on feral hog control and the possibility of hunting feral hogs.

Key comments noted during the December 2011 meeting related to this document included:

- Provide good public access.
- Open as much of the Refuge as possible to priority public uses.
- Consider impacts to private landowners adjacent to the Refuge.

- Increase the area planted in crops.
- Increase youth hunting opportunities.
- Allow public feral hog hunting opportunities.

2.0 Proposed Action and Alternatives

This section explains how alternatives were formulated and eliminated from further study, describes alternatives, and identifies the preferred alternative.

This EA evaluates the environmental consequences of hunting alternatives on the Refuge. Two alternatives are presented in this document: 1) No Action Alternative – feral hogs would not be hunted by the public on the Refuge under the current hunt program unless issued a SUP as part of a management action to take a feral hog while pursuing other game (Table 1); 2) Preferred Alternative- Feral hogs may be taken anytime, by any legal method, while hunting other game species open on the refuge (Table 1) and as deemed necessary for the control of feral hog populations.

Factors considered in the development of alternatives were:

1. Compatibility with the purpose of the Refuge and the mission of the National Wildlife Refuge System.
2. Natural resources of the Refuge.
3. Demands and expectations of public use, with concerns for safety.
4. Issues identified in the Draft Environment Assessment and Comprehensive Conservation Plan and comments from partners.
5. Requirements and guidance provided in establishment legislation, specifically the Migratory Bird Conservation Act and the Emergency Wetland Resources Act of 1986.

Table 1. Current opportunities for incidental take of feral hogs on Mingo NWR under Alternatives 1 and 2.

Action	Hunt Opportunity
Archery Deer/Turkey	Archery hunting allowed East of Ditch 4 and North of Ditch 11 (General Hunt Area) during statewide season. Hunting allowed between Ditches 4 and 6, South of Ozark Highland Auto Tour, North of Ditch 11 (Expanded General Hunt Area) and to the water's edge of Monopoly Marsh from state opening day through October 31 st . Personal property (e.g., tree stands, blinds) must be removed each day from the Wilderness Area. Archery hunting in EGHA may be closed for any authorized Deer Quota Hunts that may occur during its timeframe (e.g., Youth Firearms Deer Weekend).
Spring Turkey	Spring turkey adult and youth firearm seasons allowed East of Ditch 6, North of Ditch 11 and South of the Ozark Highland Auto Tour (General Hunt Area and Expanded General Hunt Area) during statewide season.
Deer Quota/ Special Hunts	Additional quota/special hunts allowed West of Ditch 4 and North of Ditch 11 (Managed Hunt Area), and North of Bluff Road, East of Ditch 10 to the Mingo River and Moist Soil Unit 12 (Special Hunt Area), based on population management needs and concurrence with MDC.
Waterfowl	Waterfowl hunting by MDC draw only in Pool 8 for up to 50 hunters seven (7) days per week and for three (3) days per week for up to 25 hunters in Pool 7. The 3 days will be determined prior to the start of the season. Hunting authorized ½ hour before legal sunrise and will cease at 1:00 p.m. for both areas. Some years the hunt would not occur due to lack of water or management needs for Pool 7 and/or 8.
Squirrel	Squirrel hunting allowed East of Ditch 6, North of Ditch 11 and South of the Ozark Highland Auto Tour (General Hunt Area and Expanded General Hunt Area). Season opens with statewide season and closes the evening before the opening of statewide archery season. Archery hunters may continue to take squirrel by use of archery equipment during archery deer season.
Raccoon	Open by Special Use Permit (SUP) refuge-wide only during the statewide season. Hunters will be assigned areas and dogs must have GPS or radio collars to allow for tracking of dogs.

2.1 Alternatives Eliminated from Detailed Study

2.1.1 Open hunting of feral hogs on Mingo NWR.

An alternative that would have opened the Refuge to all feral hog hunting during the entire year was not considered for detailed analysis because:

- Public safety would be compromised without oversight of when and where feral hog hunting could take place.
- Open hunting may conflict with other feral hog control techniques being utilized on the Refuge.
- Tracking the effectiveness of hunting as a control technique would be difficult.

2.2. Description of Alternatives

2.2.1 Alternative 1- No Action – Feral hogs would not be hunted by the public without obtaining a Special Use Permit as outlined in existing regulations.

This action would utilize the parameters of hunting established by current regulations. Feral hog hunting would be allowed under the current regulations by those holding a valid SUP and in areas currently open to hunting of other game species on the refuge (Figure 2).

2.2.2 Alternative 2 – Preferred Alternative- Feral hogs controlled by the use of hunting as deemed necessary based on feral hog population, other public uses and additional feral hog control techniques.

Feral hogs may be taken anytime, by any legal method, while hunting other game species open on the refuge (Figure 2) and during other periods as deemed necessary for the control of feral hog populations under a managed hunt (Figure 3). If deemed necessary by Refuge staff, a managed hunt could take place outside of existing big game species' seasons.

2.3 Comparison of Alternatives

The table below summarizes actions that are anticipated under each alternative. Some of the issues are carried into the impact assessment and described in more detail in Section 4.

Table 2: Table of alternatives analyzed in the EA.

Action	Alternative 1 (No Action)	Alternative 2 (Preferred)
Hunting feral hogs in areas open to hunting under existing Mingo Hunt Management Plan.	Feral hogs may be taken by holders of a valid SUP while hunting other species in areas approved under the Mingo Hunt Plan.	Feral hogs may be taken anytime, by any legal method, while hunting other game species open on the refuge and during other periods as deemed necessary for the control of feral hog populations.

3.0 Affected Environment

3.1 Physical Characteristics

Mingo National Wildlife Refuge lies at the northern tip of the Lower Mississippi River Ecosystem where it meets the Ozark Plateau Ecosystem. The forested wetlands found across the Mingo basin are characteristic of the Lower Mississippi River Ecosystem, while the upland forests found along the bluffs are characteristic of the Ozark Plateau Ecosystem.

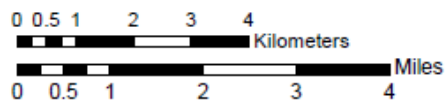
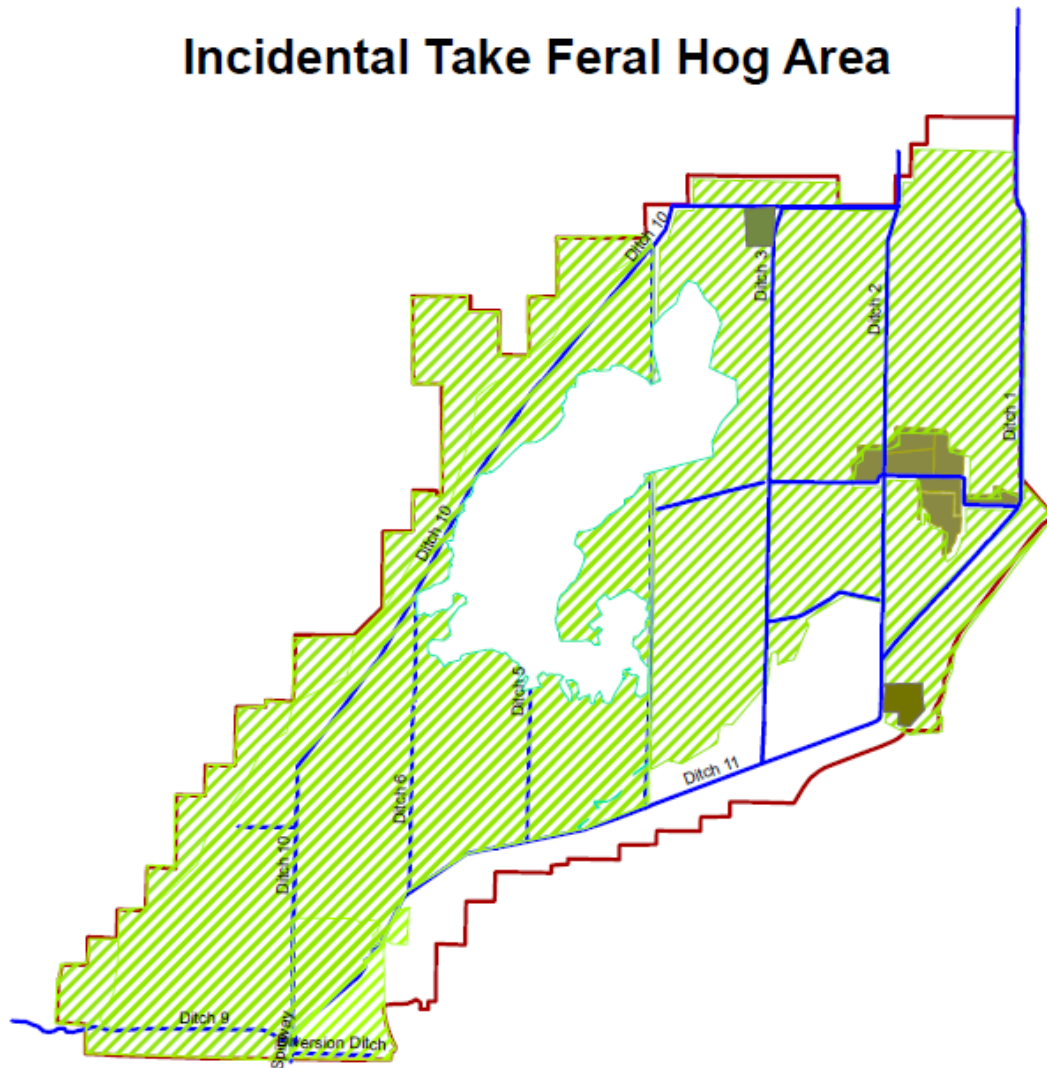
The Lower Mississippi River Ecosystem was a 25-million-acre complex of forested wetlands that extended along both sides of the Mississippi River from Illinois to Louisiana. The extent and duration of seasonal flooding from the Mississippi River fluctuated annually, recharging aquatic systems and creating a diversity of dynamic habitats that supported a vast array of fish and wildlife. Today less than 20 percent of the bottomland hardwood forest remains and most is fragmented or in scattered patches throughout the region.



U.S. Fish & Wildlife Service

Mingo National Wildlife Refuge
Stoddard and Wayne Counties, Missouri

Incidental Take Feral Hog Area




 Incidental Take Hunt Area

Figure 2. Areas open to incidental take of feral hog for Alternatives 1 and 2.



U.S. Fish & Wildlife Service

Mingo National Wildlife Refuge
Stoddard and Wayne Counties, Missouri

Managed Feral Hog Hunt Area

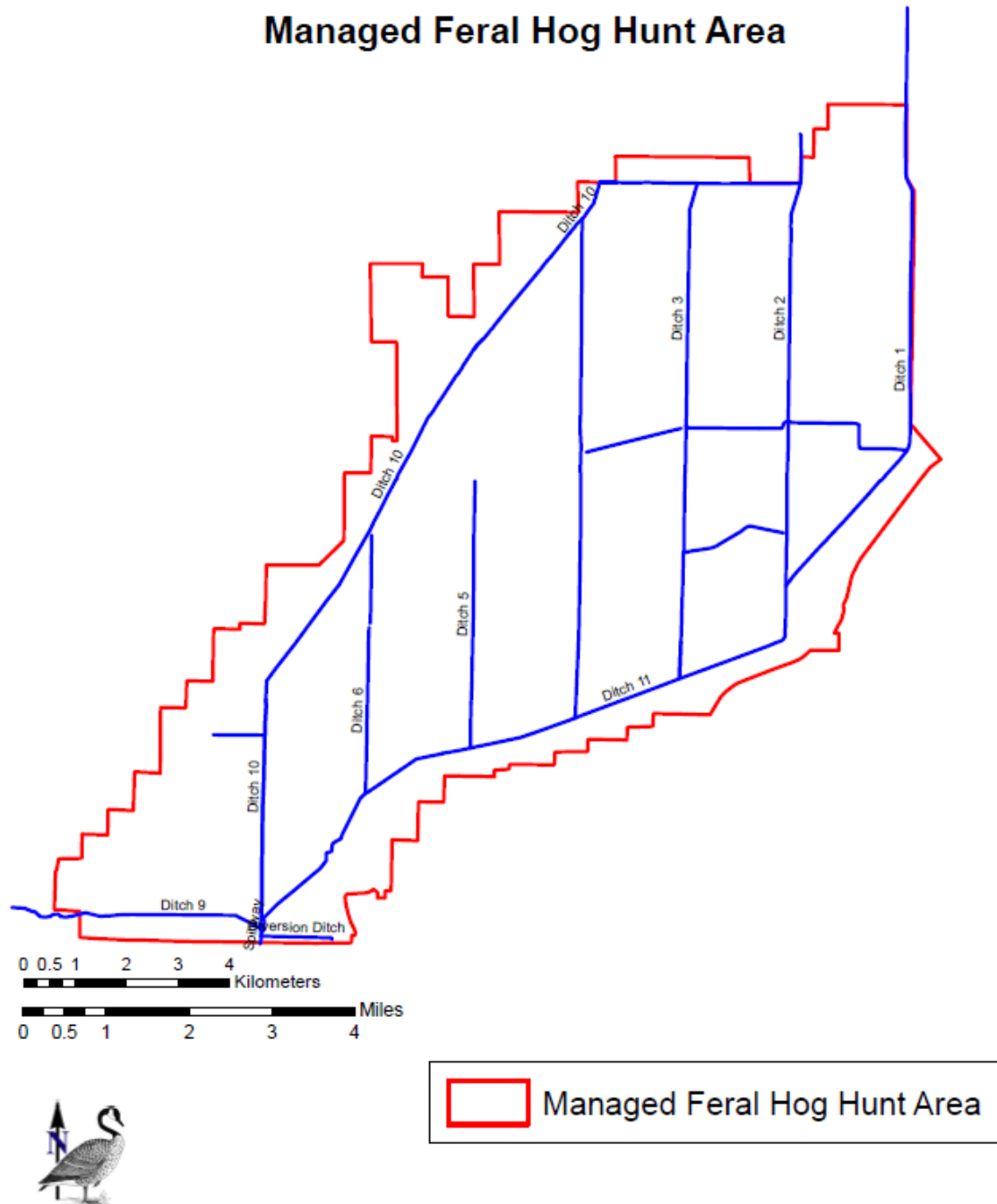


Figure 3. Area open for managed feral hog hunts under Alternative 2

3.2 Natural Resources

3.2.1 Habitat

Established in 1944 under authority of the Migratory Bird Treaty Act, the 21,592-acre Mingo NWR is located in Stoddard and Wayne counties in southeast Missouri. A shallow basin, the Refuge lies in an abandoned channel of the Mississippi River bordered on the west by the Ozark Plateau and on the east by Crowley's Ridge. The Refuge contains approximately 16,000 acres of bottomland and upland hardwood forest, 3,000 acres of marsh and water, 1,800 acres of cropland and moist soil units, and 170 acres of grassy openings.

Mingo NWR comprises many different habitat types. Due to the layout of the refuge, management units are separated into geographic blocks or by habitat management types to provide clear management objectives for each unit on the refuge. The refuge is divided into 8 management unit types with sub-units in most units (Table 3). Each unit represents a specific habitat type and most occur across refuge lands. This diversity and juxtaposition of habitat types serve to enhance biodiversity on the refuge, and each management unit provides a unique set of resources that are necessary for target wildlife to complete their respective life cycles. The Mingo Wilderness area overlaps many of the habitat units and will be addressed in each appropriate unit.

Table 3: Management Units at Mingo NWR

Unit Name	Acres
Monopoly Marsh	2008
Rockhouse Marsh	903
Green Tree Reservoirs (GTRs)	6308
Bottomland Hardwood Units (BLH)	8861
Upland Forest	1315
Moist Soil Units	800
Openings, Croplands, Food Plots	804
Open Water	387 acres of open water including 77 miles of streams, rivers, and ditches.

3.2.2 Fish and Wildlife of the Refuge

A total of 279 resident and migratory bird species use Refuge habitats throughout each year. Tens of thousands of mallards (*Anus platyrhynchos*), Canada geese (*Branta canadensis*), and

other migrating waterfowl use Refuge wetlands as stopover or wintering habitat. Hooded mergansers (*Lophodytes cucullatus*) and wood ducks (*Aix sponsa*) are resident breeders on the Refuge. Monopoly Marsh draws wood ducks from a five-state area during molting season. Bald eagles (*Haliaeetus leucocephalus*), least bitterns (*Ixobrychus exilis*), and mourning doves (*Zenaida macroura*) are among the 108 bird species that regularly breed on the Refuge.

Thirty-eight mammal species are found within the Refuge. White-tailed deer, a species popular for hunting and viewing, are abundant at a population density of over 50 per square mile. There is a wide diversity of small mammals including three species of squirrels, two species of bats, and various mice, rats, and voles. The Refuge is one of the few places in Missouri where the swamp rabbit (*Sylvilagus aquaticus*), a larger relative of the eastern cottontail rabbit (*Sylvilagus floridanus*), is known to occur. Unlike other rabbits, the swamp rabbit regularly takes to the water to move about and avoid predators. Feral hogs are also found on the refuge in increasing numbers.

Amphibians and reptiles are abundant on the Refuge with more than 30 species of frogs, toads, salamanders, and snakes including the venomous western cottonmouth (*Agkistrodon piscivorus*), southern copperhead (*Agkistrodon contortrix*), and timber rattlesnake (*Crotalus horridus*). Many of these species hibernate within the cracks and crevices of the bluffs along the perimeter of the Refuge.

At least 46 species of fish, including channel catfish (*Ictalurus punctatus*), white crappie (*Pomoxis annularis*), spotted bass (*Micropterus punctulatus*), and green sunfish (*Lepomis cyanellus*), are known to occur in the ponds and ditches of the Refuge.

3.2.3 Federally Threatened and Endangered Species

Special status species found within the project area that are listed as being either threatened (T), endangered (E) or as candidates (C) for being listed include: Indiana bat (*Myotis sodalis*).

3.3 Historical and Cultural Resources

The Refuge has completed archeological surveys for almost 7,200 acres on the Refuge, including the Mingo Job Corps campus prior to its transfer to the U.S. Forest Service. The surveys and other sources have identified more than 140 cultural resources sites on the refuge. Recorded archeological sites on the Refuge represent all Midwest United States cultural periods from the earliest Paleo-Indian through 20th century Western, a period of about 12,000 years. Nevertheless, evidence shows no human presence in the Refuge and vicinity at the time Europeans first entered the region. One standing structure on the Refuge, the Patrol or Sweet's Cabin from the early 20th century, is representative of Depression era homesteads in the region; it is historically significant and may be eligible for the National Register. As of September 2003, Stoddard and Wayne counties listed seven properties on the National Register of Historic Places, probably not indicative of the kinds of historic places that exist in the two counties. The Refuge contains one of the National Register properties, the Mingo National Wildlife Refuge Archeology District.

The North American Consultation Database run by the National Park Service to assist Federal agencies responding to the requirements of the Native American Graves and Protection and Repatriation Act lists no tribes with identified interests in Stoddard and Wayne counties. The database, however, is not a comprehensive list, being based on a limited number of legal sources. Cherokee, Choctaw, Creek, Delaware, Miami, Mingo (Iroquois), Osage, Quapaw, Seneca, and Shawnee may have had limited historic period interest in the refuge area, the Chickasaw and Tunica may have had protohistoric period interest, and the antecedent Pawnee and Wichita may have had prehistoric interest. Other interest groups that might have a cultural resources concern about the refuge have not yet been identified.

Cultural resources are important parts of the nation's heritage. The Service preserves valuable evidence of human interactions with each other and the landscape. Protection is accomplished in conjunction with the Service's mandate to protect fish, wildlife, and plant resources.

3.4 Economic Resources

The Refuge is tied to the local economy largely through the public's use of the Refuge for recreational opportunities. These opportunities typically come in the form of fishing, hunting, wildlife viewing and sightseeing. A 2005 USFWS report showed 3,458 hunting visits to the Refuge resulted in expenditures of \$68,400 for that year.

3.5 Recreational Opportunities

In general, as described in the Comprehensive Conservation Plan and Visitor Services Plan, public uses to be considered include: a combination of hiking and auto interpretive trails, wildlife viewing and photography areas, environmental education stations, visitor center with exhibits, and special seasonal wildlife programs.

Hunting opportunities proposed on the Mingo NWR already exist on state, federal and other public lands in Wayne and Stoddard Counties. Currently Butler, Bollinger, Wayne and Stoddard Counties have nearly 244,157 acres of Missouri Department of Conservation (MDC) Conservation Areas, National Forest and Army Corp of Engineer lands open for some level of hunting (big game, upland game and migratory birds).

4.0 Environmental Consequences

This chapter describes the foreseeable environmental consequences of implementing the two management alternatives in Chapter 2. When detailed information is available, a scientific and analytic comparison between alternatives and their anticipated consequences is presented, which is described as "impacts" or "effects." When detailed information is not available, those comparisons are based on the professional judgment and experience of Refuge staff and Service and State biologists.

4.1 Alternative 1- No Action – Allow areas to be hunted using current regulations

This action would utilize the parameters of hunting established by current regulations set by the

Mingo Hunt Plan. Feral hogs would be hunted by those holding a valid SUP under current regulations and in areas and seasons currently open to hunting game animals. Incidental take of hogs may occur during any Refuge hunt by any legal means for the game species being pursued, until the daily bag limit for that game species is taken (Table 1).

4.1.1 Infrastructure

Providing feral hog hunting opportunities under this alternative will not adversely affect, temporarily or permanently, the Service's ability to meet land use goals on any of the units open to hunting. Any additional refuge facility development, such as trailheads or parking lots, will not be for the sole use of hunters and would be developed under all alternatives. Parking areas and trailheads will be used by all users of the Refuge, including staff conducting day-to-day operations critical to the mission of the Refuge.

4.1.2 Natural Resources

4.1.2.1 Habitats

The selection of this alternative may have an adverse effect on the quality of wildlife habitat or the natural environment. In any alternative, the amount of habitat by type would not change from the current situation. With any alternative, some minor trampling of vegetation from hunters using areas other than established trails is expected. Access throughout Refuge units for hunting is typically by foot. Occasionally hunters access some Refuge units via bicycle from the parking area at McGee Gate. This method of access is allowed on existing roads and levees and has no or only minor adverse impacts to Refuge lands.

Impacts to Refuge soils and vegetation by hunters are minimal but can be substantial from feral hogs. Hunting is conducted on foot mostly by individuals or small groups. Typically hunter groups travel in dispersed patterns so soil compaction and vegetation trampling will be minimal. Current regulations prevent the cutting or removal of vegetation for hunting purposes.

Boating activity on the Refuge may occur while hunting feral hogs. Hunters use boats to access areas for deer, turkey and waterfowl hunting. Because Refuge users, including hunters, are not allowed to use gasoline powered motors, there will be no impacts to air quality or solitude from the use of boats. Boating is only allowed in ditches and would likely not impact habitat in adjoining areas.

Other potential types of habitat damage specifically attributed to hunting activities, such as littering, are not significant. Refuge specific regulations limit the adverse impact of activities such as cutting of vegetation and the use of screw-in steps, through their prohibition.

Feral hog populations are at a level that could cause habitat damage. When populations are high, feral hogs may damage habitat on the Refuge or on nearby public and private lands. Habitat damage on the Refuge and adjacent public lands appears to be localized but is expected to

continue to grow. The Service receives some notifications of feral hog damage from surrounding landowners adjacent to the Refuge.

4.1.2.2 Biological Impacts

This alternative may result in biological impacts from feral hog populations. Feral hog hunting will continue as it has under the current hunt plan by SUP only. This would reduce the ability of hunters to take feral hogs and remove them from the Refuge, thus increasing impacts to habitat and native species.

4.1.2.3 Listed Species

No effect is expected for any of the threatened and endangered species found within the Refuge as a result of this alternative.

4.1.3 Historic Properties and Cultural Resources

This alternative will result in the potential for additional ground disturbance, but would have no expected effect on any historic properties. Feral hogs are known to disturb the ground with rooting and other activities. This damage may impact cultural resources. Any control activities that might cause an effect to a historic property would be subject to a case by case Section 106 review.

4.1.4 Cumulative Impact Analysis of the No Action Alternative

4.1.4.1 Anticipated Direct and Indirect Impact on Wildlife Species

Feral Hogs

This alternative would have additional effect on some wildlife populations by reducing the ability to control feral hogs on the Refuge, thus increasing impacts to native species and habitat from feral hog damage.

Feral hog population and management are currently overseen by Missouri Department of Agriculture (MDA). The MDC also attempts to control feral hog populations within the state. Feral hogs are a non-regulated species and are not managed as game animals. The current estimated population of feral hogs on Mingo NWR is 400-700 animals (Personal communication, MDC). The desired population of feral hogs on the Refuge is zero. The U.S. Department of Agriculture estimates there are 5,000,000 feral swine in the country and MDC estimates there are 10,000 feral swine in the state.

Hunters have taken feral hogs each year since 2011 on the Refuge. A total of 28 feral hogs have been taken during the managed hunts since 2011 and 22 were taken in the 2013 by archery hunters in the general hunt area (the first year reporting was required). State and national harvest totals are unavailable due to lack of tracking and reporting requirements by any one agency. Under this alternative, it is expected that hunters would harvest 40-50 feral hogs per year on the

Refuge if populations remain stable. As feral hog populations increase, this number could increase.

Game Species

Impacts from this alternative are expected to increase, as limitations to feral hog population control may lead to increased competition for resources and may lead to direct mortality through predation of game species by feral hogs.

Non-hunted Species

Non-hunted wildlife would include small mammals such as voles, moles, mice, and shrews; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. Except for migratory birds and some species of migratory butterflies and moths, these species have very limited home ranges and hunting would not affect their populations regionally.

Disturbance to non-hunted wildlife would increase slightly. However, significant disturbance would be unlikely since small mammals are beginning to become inactive during late November and early December, the main game hunting seasons, and many of these species are nocturnal during warmer months. Both of these qualities make hunter interactions with small mammals rare.

Hibernation or torpor by cold-blood reptiles and amphibians also limits their activity when temperatures are low. Squirrel and turkey hunters may encounter reptiles and amphibians during a portion of the hunting season. Invertebrates are also not active during cold weather and would have few interactions with hunters during the cooler portions of hunting season.

During spring and early summer, hunters may encounter breeding wood ducks or hooded mergansers on the refuge. These interactions are not expected to be significant and disturbance would be rare.

Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

4.1.4.2 Anticipated Direct and Indirect Impact on Refuge Programs, Facilities, and Cultural Resources Other Refuge Wildlife-Dependent Recreation

Other Refuge Wildlife-Dependent Recreation: Each year thousands of people visit Mingo NWR (122,667 visits in 2013) to enjoy the resources. Wildlife observation visits, particularly bird watching, account for the highest wildlife-dependent recreational use recorded for the Refuge.

Under this alternative, the public feral hog hunting opportunity would remain the same and by SUP only. Hunting is also a way for the public to gain an increased awareness of Mingo NWR and the National Wildlife Refuge System.

Refuge Facilities. No additional impacts to Refuge facilities (roads, parking lots, trails) will occur with this alternative. Under this alternative, Refuge facilities would continue as they are now. Maintenance or improvement of existing roads and parking areas will cause minimal short term impacts to localized soils and may cause some temporary wildlife disturbance.

Cultural Resources. This alternative will not have any additional impacts to cultural resources through hunting activities but may have impacts to cultural resources from increased hog populations and activities. Any hunting activities that might cause an effect to a historic property would be subject to a case by case Section 106 review.

4.1.4.3 Anticipated Direct and Indirect Impact on Refuge Environment and Community

The No Action alternative will have little if any additional impact on soils, air quality, water quality or solitude. Vegetation, as stated above, may be affected if the hog population continues to increase to a level high enough to cause degradation of Refuge communities.

This alternative may have impacts on hunting opportunities in the local area. Under this alternative an SUP would continue to be necessary for hunters to take feral hogs and may limit the number of hogs taken by hunters. This alternative would also not increase public hunting opportunity and may lead to increased usage of surrounding private and public lands.

4.1.4.4 Other Past, Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts

This alternative would have no additional anticipated impacts from hunting.

4.1.4.5 Anticipated Impacts If Individual Hunts Are Allowed To Accumulate

National Wildlife Refuges, including Mingo NWR, conduct or will conduct hunting programs within the framework of State and Federal regulations. There are currently no feral hog hunting regulations in the state. If such regulations are implemented in the future, refuge activities will be adjusted to reflect those regulations. Additionally, Refuge will coordinate with MDC and MDA annually to maintain regulations and programs that are consistent with the States' management program.

The hunting of feral hogs will have minimal impacts to state populations. It is expected to positively impact local and regional populations by reducing the current hog population in the area. Refuge personnel expect additional animals will be harvested on Refuge land assisting in the goal of hog elimination on the Refuge. This additional harvest will allow populations of resident wildlife to be better maintained at healthy levels and more opportunities for the public to participate in other hunting activities.

Refuge personnel expect and witness that most hunters respect spacing needs between hunters and blinds and will essentially regulate themselves. User conflicts might occur between non-consumptive users and hunters. This is not expected, as hunting seasons take place when most

non-consumptive uses (wildlife observation, photography) have become minimal or occur in areas that remain closed to hunting.

4.1.5 Environmental Justice

Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations” was signed by President Bill Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities’ access to public information and participation in matters relating to human health or the environment. This assessment has not identified any adverse or beneficial effects for either alternative unique to minority or low-income populations in the affected area. Neither alternative will disproportionately place any adverse environmental, economic, social, nor health impacts on minority or low income populations.

Hunting opportunities proposed on Mingo NWR already exist on state, federal and other public lands in the area where the Refuge is located. The Refuge Recreation Act of 1962 (16U.S.C. 460K) and the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668-ddee) provide authorization for hunting and fishing on national wildlife refuges. The effects of hunting on Refuges have been examined in several environmental review documents, including the Final Environmental Impact Statement on the Operation of the National Wildlife Refuge System (1976), Recommendations on the Management of the National Wildlife Refuge System (1978), and the Draft Environmental Impact Statement on the Management of the National Wildlife Refuges (1988). Nothing in the establishing authority for Mingo National Wildlife Refuge [Fish and Wildlife Act of 1956{ 16U.S.C. 742f}] precludes hunting on the Refuge.

4.2 Alternative 2 – Preferred Alternative- Feral hogs could be controlled by the use of hunting as deemed necessary based on feral hog population, conflicting public use and other feral hog control techniques.

Feral hogs may be taken anytime, by any legal method, while hunting other game species open on the refuge (Figure 2) and during other periods as deemed necessary for the control of feral hog populations under a managed hunt (Figure 3).

If a deemed necessary by Refuge staff, a managed hunt could take place outside of existing big game seasons. The number of hunters and exact location on the refuge would be set at the time of the hunt, based on hog population estimates, other refuge activities and refuge staff availability. The hunt dates would occur outside of big games seasons for that year on the Refuge. Only firearms approved for use during the Missouri Firearms Deer Hunt will be allowed. A managed hunt would be implemented when resource damage and hog populations are at levels that pose a long-term impact to habitat and native species populations.

4.2.1 Infrastructure

Providing feral hog hunting opportunities under this alternative will not adversely affect, temporarily or permanently, the Service's ability to meet land use goals on any of the units open to hunting. Any additional refuge facility development, such as trailheads or parking lots, will not be for the sole use of hunters and would be developed under all alternatives. Parking areas and trailheads will be used by all users of the Refuge, including staff conducting day-to-day operations critical to the mission of the Refuge. There will be a change in wildlife habitat if/where parking lots and trails are developed as those areas are converted to gravel or bare soil but wildlife may still use these areas.

4.2.2 Natural Resources

4.2.2.1 Habitats

The selection of this alternative may have an adverse effect on the quality of wildlife habitat or the natural environment. In any alternative, the amount of habitat by type would not change from the current situation. With any alternative, some minor trampling of vegetation from hunters using areas other than established trails is expected. Access throughout Refuge units for hunting is typically by foot. Occasionally hunters access some Refuge units via bicycle from the parking area at McGee Gate. This method of access is allowed on existing roads and levees, therefore, presents no significant adverse impacts to Refuge lands.

Impacts to Refuge soils and vegetation by hunters are minimal but can be substantial from feral hogs. Hunting is conducted on foot mostly by individuals or small groups. Typically hunter groups travel in dispersed patterns so soil compaction and vegetation trampling will be minimal. Current regulations prevent the cutting or removal of vegetation for hunting purposes.

Boating activity on the Refuge may occur while hunting feral hogs. Hunters use boats to access areas for deer, turkey and waterfowl hunting. Because Refuge users, including hunters, are not allowed to use gasoline powered motors, there will be no impacts to air quality or solitude from the use of boats. Boating is only allowed in ditches and would likely not impact habitat in adjoining areas.

Other potential types of habitat damage specifically attributed to hunting activities, such as littering, are not significant. Refuge specific regulations limit the adverse impact of activities such as cutting of vegetation and the use of screw-in steps, through their prohibition.

Feral hog populations are at a level that could cause habitat damage. When populations are high, feral hogs may damage habitat on the Refuge or on nearby public and private lands. Habitat damage on the Refuge and adjacent public lands appears to be localized but is expected to continue to grow, but may be reduced under this alternative as additional control may be implemented. The Service receives some notification of feral hog damage from surrounding landowners adjacent to the Refuge.

4.2.2.2 Biological Impacts

This alternative will result in few additional biological impacts. There will be some additional impact to resident wildlife when increased hunting occurs due to increased foot traffic and game harvest. The harvest of Refuge wildlife species will be in accordance with Federal regulations and Missouri state limits or limits set by the Refuge. Other wildlife not being harvested will be disturbed by hunters flushing or moving the wildlife as the animals try to avoid human contact. This disturbance will be similar to the disturbance non-hunted animals experience on state Conservation Areas and federal lands and be minimal and temporary in nature.

4.2.2.3 Listed Species

No effect is expected for any of the threatened and endangered species found within the Refuge as a result of this alternative.

4.2.3 Historic Properties and Cultural Resources

This alternative will result in the potential for reduced ground disturbance and it would have no effect on any historic properties. Feral hogs are known to disturb the ground with rooting and other activities. This activity would result in increased control of hogs and may reduce ground disturbance. Any control activities that might cause an effect to a historic property would be subject to a case by case Section 106 review.

4.2.4 Cumulative Impact Analysis of the Preferred Alternative

4.2.4.1 Anticipated Direct and Indirect Impact on Wildlife Species

Feral Hogs

This alternative would have additional effect on some wildlife populations by increasing the ability to control feral hogs on the Refuge, thus decreasing impacts to native species and habitat from feral hog damage. A managed hunt would be implemented when resource damage and hog populations are at levels that pose a long-term impact to habitat and native species populations.

Feral hog population and management are currently overseen by Missouri Department of Agriculture. The MDC also attempts to control feral hog populations within the state. Feral hogs are a non-regulated species and are not managed as game animals. The current estimated population of feral hogs on Mingo NWR is 400-700 animals (Personal communication, MDC). The desired population of feral hogs on the Refuge is zero. The U.S. Department of Agriculture estimates there are 5,000,000 feral swine in the country and MDC estimates there are 10,000 feral swine in the state.

Hunters have taken feral hogs each year since 2011 on the Refuge. A total of 28 feral hogs have been taken during the managed hunts since 2011 and 22 were taken in the 2013 by archery hunters in the general hunt area (the first year reporting was required). State and national harvest

totals are unavailable due to lack of tracking and reporting requirements by any one agency. Under this alternative, it is expected that hunters would harvest 75-100 feral hogs per year if populations remain stable. As feral hog populations increase, this number could increase.

Game Species

Impacts from this alternative to game species on the refuge are expected to be reduced compared to the No Action alternative. With increased ability to control hog populations through the use of hunting, direct and indirect impacts such as predation, habitat loss and resource competition is expected to be reduced, thus benefiting game species.

Non-hunted Species

Non-hunted wildlife would include small mammals such as voles, moles, mice, and shrews; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. Except for migratory birds and some species of migratory butterflies and moths, these species have very limited home ranges and hunting would not affect their populations regionally.

Disturbance to non-hunted wildlife would increase slightly from additional hunting. However, significant disturbance would be unlikely since small mammals are beginning to become inactive during late November and early December, the main game hunting seasons, and many of these species are nocturnal during warmer months. Both of these qualities make hunter interactions with small mammals rare. The reduction of feral hog populations would be beneficial to small mammals by reducing predation and habitat destruction from hogs.

Hibernation or torpor by cold-blood reptiles and amphibians also limits their activity when temperatures are low. Squirrel and turkey hunters may encounter reptiles and amphibians during a portion of the hunting season. Invertebrates are also not active during cold weather and would have few interactions with hunters during the cooler portions of hunting season. The reduction of feral hog populations would be beneficial to these species by reducing predation and habitat destruction from hogs.

During spring and early summer, hunters may encounter breeding wood ducks or hooded mergansers on the refuge. These interactions are not expected to be significant and disturbance would be rare.

Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

4.2.4.2 Anticipated Direct and Indirect Impact on Refuge Programs, Facilities, and Cultural Resources

Other Refuge Wildlife-Dependent Recreation Each year thousands of people visit Mingo NWR (122,667 visits in 2013) to enjoy the resources. Wildlife observation visits, particularly

bird watching, account for the highest wildlife-dependent recreational use recorded for the Refuge.

Under this alternative, the feral hog hunting opportunity would increase while not impacting non-hunting recreational activities significantly. Hunting is also a way for the public to gain an increased awareness of Mingo NWR and the National Wildlife Refuge System and reduce the feral hog population.

Refuge Facilities. No additional impacts to Refuge facilities (roads, parking lots, trails) will occur with this alternative. Under this alternative, Refuge facilities would continue as they are now. Maintenance or improvement of existing roads and parking areas will cause minimal short term impacts to localized soils and may cause some temporary wildlife disturbance.

Cultural Resources. This alternative will not have any additional impacts to cultural resources. Activities that might cause an effect to a historic property would be subject to a case by case Section 106 review.

4.2.4.3 Anticipated Direct and Indirect Impact on Refuge Environment and Community

The Preferred Alternative will have little if any direct additional impact on soils, air quality, water quality or solitude. The reduction of feral hog populations would improve both soil and water conditions by reducing the impact from rooting and wallowing. Vegetation, as stated above, could be affected if the feral hog population increases to a level high enough to cause degradation of plant communities.

This alternative may have impacts on feral hog hunting opportunities in the local area. Under this alternative additional hunters would be able to utilize the Refuge and more people will use facilities both on and off of the Refuge.

As a result of this alternative, expenditures by visitors for meals, lodging and transportation would increase in the communities where these Refuge lands are located. According to the 2006 National Survey of Fishing, Hunting, and Wildlife Associated Recreation, hunters spent \$234.4 million in Missouri on hunting trip-related expenses. In addition, Missouri residents spent \$739.7 million on non-consumptive recreational activities in 2006 (US CENSUS 2006). A total of \$3.4 billion was spent on wildlife related recreation in Missouri. Municipalities and community organizations could bring additional tourism revenues into their economies by establishing partnerships with the Service to develop and promote the recreational opportunities that are available on the Refuge lands in their communities.

Feral hog hunting would benefit vegetation as it is used to keep hog populations lower, thus improving overall habitat conditions. The biological integrity of the Refuge would be more protected under this alternative, and the Refuge purpose of restoring bottomland hardwoods for migratory birds and wildlife would be achieved.

Impacts to the natural hydrology are expected to improve under this alternative due to the reduced impact from feral hog rooting. The Refuge staff expects impacts to air and water quality to be minimal and only due to Refuge visitor's use of automobiles on adjacent township and

county public roads. The effect of these Refuge-related activities on overall air and water quality in the region are anticipated to be negligible.

Existing State water quality criteria and use classifications are adequate to achieve desired on-Refuge conditions; thus, implementation of the proposed action would not impact adjacent landowners or users beyond the constraints already implemented under existing State standards and laws.

Impacts associated with solitude are expected to be minimal given the limited time, season, and space management techniques used to avoid conflicts among user groups.

There is a potential to have some minimal disturbance on the general public, nearby residents, and Refuge visitors. The disturbance factor is considered minimal, as feral hog hunting is already taking place on many federal and state properties, and on hundreds of thousands of acres of private property.

The Ozark Highland Auto Tour is open from March 1st - November 30th. Some additional conflicts might be expected as part of this alternative as more people would be in the expanded hunt area during season. This is expected to be minimal as only the very northern portion of the expanded hunt area would be in contact with the auto tour. The Ozark Highland Auto Tour would be closed during any managed feral hog hunts in the area.

4.2.4.4 Other Past, Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts

Hunting has been allowed on Mingo NWR for multiple decades and approved and registered in the Code of Federal Regulations each hunting season if changes are warranted. If public use levels expand in the future or unanticipated conflicts between user groups may occur, Service experience has proven that time and space zoning can be an effective tool in eliminating conflicts between user groups. On a case by case basis, the onsite manager will determine if such a tool is necessary to limit conflicts.

4.2.4.5 Anticipated Impacts If Individual Hunts Are Allowed To Accumulate

National Wildlife Refuges, including Mingo NWR, conduct or will conduct hunting programs within the framework of State and Federal regulations. The addition of a managed hunt and subsequent draw would not impact the refuge staffs ability to complete other activities. There are currently no feral hog hunting regulations in the state. If such regulations are implemented in the future, refuge activities will be adjusted to reflect those regulations. Additionally, the Refuge will coordinate with MDC and MDA annually to maintain regulations and programs that are consistent with the States' management program.

The hunting of feral hogs will have minimal impacts to state populations. It is expected to positively impact local and regional populations by reducing the current hog population in the area. Refuge personnel expect additional animals will be harvested on Refuge land assisting in the goal of hog elimination on the Refuge. This additional harvest will allow populations of

resident wildlife to be better maintained at healthy levels and more opportunities for the public to participate in other hunting activities.

Refuge personnel expect and witness that most hunters respect spacing needs between hunters and blinds and will essentially regulate themselves. User conflicts might occur between non-consumptive users and hunters. This is not expected, as hunting seasons take place when most non-consumptive uses (wildlife observation, photography) have become minimal or occur in areas that remain closed to hunting.

4.2.5 Environmental Justice

Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations” was signed by President Bill Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities’ access to public information and participation in matters relating to human health or the environment. This assessment has not identified any adverse or beneficial effects for either alternative unique to minority or low-income populations in the affected area. Neither alternative will disproportionately place any adverse environmental, economic, social, nor health impacts on minority or low income populations.

Hunting opportunities proposed on Mingo NWR already exist on state, federal and other public lands in the area where the Refuge is located. The Refuge Recreation Act of 1962 (16U.S.C. 460K) and the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668-ddee) provide authorization for hunting and fishing on National Wildlife Refuges. The effects of hunting on Refuges have been examined in several environmental review documents, including the Final Environmental Impact Statement on the Operation of the National Wildlife Refuge System (1976), Recommendations on the Management of the National Wildlife Refuge System (1978), and the Draft Environmental Impact Statement on the Management of the National Wildlife Refuges (1988). Nothing in the establishing authority for Mingo National Wildlife Refuge [Fish and Wildlife Act of 1956{ 16U.S.C. 742f}] precludes hunting on the Refuge.

4.3 Comparison of Environmental Impacts by Alternative

Table 4. Environmental impacts for each alternative.

RESOURCE	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2 (Preferred)
Feral Hogs	No additional impact to current populations. Increasing population trend expected to continue.	Increase in harvest is expected due to additional hunting opportunities. Slower expansion or reduction in population is expected.
Game Species	No additional impact to current populations	Improvement of overall habitat on refuge due to reduced impacts from feral hogs
Non-Hunted Species	No additional impact to current populations	Improvement of overall habitat on refuge due to reduced impacts from feral hogs
Other Concerns - Habitats	No change expected	Improvement of overall habitat on refuge due to reduced impacts from feral hogs
Threatened and Endangered Species	No impact	No impact
Historic and Cultural Resources	No impact	Improved protection of cultural resources through the reduction of ground disturbance from feral hogs.

5.0 Environmental Justice

No one group or Tribe represented in the community would be disproportionately impacted by building the administrative facility on the parcel. Thus, Alternatives 1, 2 and 3 would not result in any environmental justice issues.

6.0 List of Preparers

Ben Mense, Refuge Manager, Mingo National Wildlife Refuge
Lindsey Landowski, Assistant Refuge Manager, Mingo National Wildlife Refuge
Brad Pendley, Wildlife Biologist, Mingo National Wildlife Refuge

For issues identification and public use ideas:

Public comments from public scoping meeting.

Federal and state listed threatened and endangered species:

<http://www.fws.gov/midwest/endangered/lists/missouri-cty.html>

<http://mdc.mo.gov/discover-nature/field-guide/endangered-species/endangered-species-field-guide>

Draft document reviewed by:

U.S. Fish and Wildlife Service, Bloomington, MN

The Mingo Hunting Plan will be a “Living Document” and this amendment is an example of such a change. It is anticipated that changes will need to occur as data is gathered, habitats are restored and wildlife populations fluctuate. All major changes will be announced through the development of a supplemental Environmental Assessment and must always remain compatible with the purpose for establishing the Mingo National Wildlife Refuge.

7.0 References

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http://www.fws.gov/midwest/endangered/lists/cty_indx.html#missouri

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West, B. C., A. L. Cooper, and J. B. Armstrong. 2009. Managing wild pigs: A technical guide. Human-Wildlife Interactions Monograph 1:1–55.

8.0 Response to Comments on the Environmental Assessment and Hunt Plan

The Service solicited public comments for the Draft Mingo Hunt Plan and supporting Draft Environmental Assessment. A 30-day comment period began on September 17th, 2012 and ended on October 17th, 2012. Copies of the document were posted on the Refuge website and

were available at the Mingo Public Library and the Mingo NWR Visitor Center. A link to the document was also placed on the Mingo NWR Facebook page. A listening station was also held at the Puxico VFW from 12 p.m. to 8 p.m. on September 25th, 2012 where Refuge staff was available to discuss the proposed hunt plan or EA with any interested public. News releases, web site and social media were used to notify the public of this event. A letter was sent to adjacent landowners on December 13th, 2012 and a second open comment period was held between December 14th, 2012 and January 4th, 2013. News releases, the Refuge web site and social media were used to notify the public of the second open comment period.

An additional 30 day comment period was held for this hunt plan amendment from August 8th, 2014 to September 8th, 2014. A listening station was set up at the Mingo Visitor Center on August 26th, 2014 from 12:00 p.m. to 6:00 p.m. for this EA where Refuge staff was available to discuss the proposed hunt plan amendment or EA with any interested public.

23 individuals provided comments that were received via email, in writing or through Facebook for the first two outreach efforts. The comments fall into 6 broad topics and were grouped as such. Some comments were identical and are listed one time. The following comments were related specifically to feral hogs.

Feral Hogs

Comment: I am very concerned about the hog issue we have. This has caused many problems to my property and the hunting of deer has declined because of the hogs. In my opinion there needs to be a public hog hunt to help eliminate this problem.

Response: We agree. Feral hogs are becoming an issue both on and off of the Refuge. They are harming habitats of all types. We encourage all hunters to take feral hogs while hunting other species on the Refuge. We don't feel that a public hunt specifically for hogs would be beneficial. It has been shown in scientific literature that disturbing hogs by hunting, scatters and educates them making it much harder to implement more successful techniques such as trapping.

9.0 Approvals

Submitted by:

Ben J. Mense, Project Leader

Date

Concur:

Timothy Yager, Refuge Supervisor Area 2

Date

Charles Blair, Regional Chief Region 3
National Wildlife Refuge System

Date

Approved:

Thomas O. Melius, Regional Director
Region 3, U.S. Fish & Wildlife Service

Date

DRAFT